
The evolution of drug-resistant microorganisms in patients with prolonged mechanical ventilation.

Chien JY, Hsueh PR, Yu CJ, Yang PC.

Department of Internal Medicine, National Taiwan University Hospital, Yun-Lin Branch, Douliu, Taiwan.

Abstract

BACKGROUND: Patients requiring prolonged mechanical ventilation (PMV) tend to become reservoirs of antimicrobial resistance. We assessed antimicrobial-resistant microorganisms in the respiratory tracts of patients receiving PMV.

METHODS: Over a 6-month period, the microorganisms from tracheal aspirates of PMV patients with lower airway infection were analyzed.

RESULTS: Antimicrobial use was greatest during the acute critical stage of respiratory failure. Antimicrobial resistance in Pseudomonas aeruginosa and Klebsiella pneumoniae peaked during the fourth to 15th weeks of PMV. Methicillin-resistant Staphylococcus aureus (MRSA) developed rapidly during the first 3 weeks of PMV. The acquisition of multidrug-resistant P aeruginosa and MRSA were significantly correlated with previous exposure to ceftazidime (odds ratio [OR] = 121.3 and 72.5; P = .01 and .01, respectively). The rise of multidrug-resistant Acinetobacter baumannii was significantly correlated with previous exposure to piperacillin/tazobactam (OR = 26.81; P = .02) and imipenem (OR = 16.91; P = .03). Using univariate and multivariate logistic regression models, the lower respiratory tract infections with multidrug-resistant microorganisms were independently associated with increased 6-month mortality (OR = 3.41; P < .01).

CONCLUSION: In patients receiving PMV, lower respiratory tract infection with multidrug-resistant microorganisms is common and is associated with higher mortality.

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